GARDEN AND FOREST.

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The Field of Landscape-art.

We are constantly asked whether the profession of landscape-gardening offers a promising field for young men who are looking for some calling in life which will be useful and remunerative. We have always felt obliged to reply that there is comparatively small demand for the counsel of landscape-gardeners in this country, and we have added that until the true functions of these artists are more thoroughly recognized the call for their professional services will be limited. Most of the men who make inquiries on this point have themselves hazy notions as to what the legitimate field of a landscape-gardener is. The prevalent idea is that his work is chiefly ornamental and that his province is to do about the same thing for the surroundings of a house that the decorative artist does for its interior when he selects the furniture, rugs and hangings and decides upon color-schemes and the like. That is, after an architect has built a house, it is considered proper to call in a landscape-gardener to plant some ornamental trees and shrubs about it and lay out paths and flower-beds in order to beautify the grounds. Now, it is true that the landscape-gardener, like any other artist, has to deal with beauty, but his first and fundamental study is to provide for human use, for comfort and for convenience. An architect of taste does not make a building and then hang ornaments upon it without and within. His structures will be beautiful, but this beauty is developed out of the design so as to be an essential part of it, and this is so profoundly true that the best architectural work will be beautiful primarily because it serves the purpose for which it was created. The same rule should hold in regard to the development of the grounds about a house. These should be primarily laid out for use and convenience, and their beauty should grow out of their perfect adaptation to the wants of those who are to use them. In short, as we have said a great many times, the house and grounds should be planned together, so as to make one picture; but even beyond this they should have a unity of design which is more than superficial. In fact, the beauty of the scene, which includes both the house and the grounds, should grow up from the general design and framework of the house and grounds as a place where all the varied necessities of the family in the way of health and happiness and home life are the first things considered. This is the reason why no ready-made house-plan is adapted to all sorts of ground and why any ready-made planting plan is not available for use with all sorts of houses.

The most hopeful symptom we know is that architects are inquiring more and more for competent designers in landscape to assist them. That is, they feel the need of advice from some one who is trained to the planning and modeling of ground, one who is skilled to see at once all the possibilities that lie in any situation, not only for appearance but for use; one who knows how to take advantage of any diversities of surface or differences of outlook so as to make them available for varied purposes. Such a man can be of assistance to an architect not only in locating the house in such a way that it will appear to the best advantage, but also for placing it where the principal rooms will have a pleasing outlook. He will contrive facilities for access to it and agreeable lines of approach. The arrangement of different parts of the grounds for special uses requires thought and experience which are outside of the ordinary lines of the architect's study, and therefore the best architects have learned that the highest service which a landscape-gardener can render is precisely at the point where the essentials of the combined design of house and grounds are being considered.

All this means that a landscape-gardener ought to be much more than a mere decorative planter. The successful designing of public parks or of private grounds for daily occupation means first of all the study of human wants—the necessities of men and women and children of various circumstances and conditions. A good artist must be primarily a man of sound judgment and he should have a cultivated mind, wide sympathies and catholic tastes. Reading and travel and scholarship can do for the designer in landscape all that they can accomplish for the architect. A man may be able to mass a shrubbery effectively or arrange a border of herbaceous plants with skill and yet not have a particle of that profounder art which was seen in the grouping of the great buildings at the Columbian Exposition, and the planning of that Court of Honor which was the crowning artistic success of Mr. Olmsted's life. This view of the case contemplates an ideal that is rarely attained, and it is because the work of real artists in this line is rarely seen and still more rarely appreciated that the very existence of such an art is practically ignored or denied. If City Park Boards realized what a trained park maker is capable of creating out of a given piece of ground they would never content themselves with asking an engineer or surveyor or mere gardener to design a public pleasure-ground. We ought to have reached a stage of civilization when it is no longer believed that any unskilled journeyman is competent to lay out a park or garden, or pass judgment on the plans of a park or garden. If any artist needs sound judgment united with taste and training it is the man who studies public and private grounds and prepares them for the use and enjoyment of man.

We have already taken occasion to say that the opposition to the recently established forest reservations which is made by members of Congress from certain of the states in which they are situated is not shared by all the people. The *Miner and the Electrician*, a paper published in Spokane, Washington, speaks of President Cleveland's act as one of the most statesmanlike measures that ever emanated from the White House. It characterizes the opposition to the reservation principle as extremely short-sighted and selfish, and adds that people of intelligence, whose judgment is not warped by any money considerations in the immediate future, see the wisdom and justice of the act. In fact, it is the people in the neighborhood of the reservations who will receive the most substantial benefit from them, and the future population of the great north-west has rights which the people of this gen-

eration are bound to respect, in spite of the protests of timber sharks and mining promoters who feel that their designs upon the Government domain are in danger of defeat. No doubt, there are many men who honestly think that the proclamation will work hardship to the regions in which the reserves lie, but any one who reads the statement of the commission published in this journal two weeks ago and notes how carefully every privilege of settler, prospector and miner has been considered, must come to the conclusion that no legitimate privilege is imperiled, but that the rights and property of all the people are preserved and guarded against attack by the lawless who think only of their own present benefit.

Pinus flexilis.

THE illustration on page 165 of this issue reproduces a photograph of a remarkably noble specimen of the Rocky Mountain White Pine, Pinus flexilis, which is standing in front of the United States military post in the Yellowstone National Park, in Wyoming, where it is growing at an elevation of about 7,000 feet above the level of the sea, and at three feet above the surface of the ground has a trunk diameter of nearly five feet.

Pinus flexilis is the first of the Rocky Mountain conifers known to science, having been discovered in 1820 near the base of Pike's Peak, in Colorado, by Dr. Edwin James, the naturalist and surgeon of Long's Expedition to the Rocky Mountains, who described it three years later in his journal of this expedition. It is one of the five-leaved species, although it differs from our eastern White Pine in its usually shorter cones, much thicker cone-scales and nearly wingless seeds, and is more like the Swiss Stone Pine, Pinus Cembra, than any other American Pine, differing, however, from that species in the internal structure of the leaves. Never forming very extensive forests, Pinus flexilis, which owes its name to the flexibility of its stout and extremely tough branches, is widely distributed from Bow River, in Alberta, southward along the Rocky Mountains to eastern Texas and westward over the mountain ranges of Wyoming, Montana, Colorado, Utah and Nevada to south-eastern California, where it occurs on several of the desert ranges, and even crosses the summit of the Sierra Nevada to the upper waters of King's River, where it grows up to elevations of nearly 12,000 feet above the level of the sea. It is abundant also on many of the mountain ranges of Arizona and New Mexico, and, no doubt, extends over our southern boundary. Most frequently growing singly or in small groves and among other conifers, this Pine is the principal tree on some of the foot-hills of the eastern slope of the Rocky Mountains in Montana, and on many of the ranges of central Nevada between 7,000 and 10,000 feet above the sea-level it forms extensive forests, and is the most valuable tree of the region, giving the name of White Pine to several mountain ranges and districts. In northern Arizona and New Mexico it grows to its largest size, here sometimes producing cones eight or ten inches long, although the cones on this tree growing in Colorado and northward are often not more than three or four inches in length. The Rocky Mountain White Pine is a tree usually forty or fifty feet in height, with a short massive trunk from two to four, or rarely five feet in diameter; occasionally, however, it attains a height of seventy or eighty feet, and at high elevations on the mountains of central Nevada it is frequently reduced to a spreading shrub with stems only two or three feet tall.

Our illustration gives a good idea of the habit of this tree as it grows under favorable conditions, although on the mountains of northern Arizona it frequently produces taller and straighter trunks, which here and in Nevada and Arizona are frequently manufactured into lumber.

Pinus flexilis has been in cultivation in this country and in Europe since 1861, when Dr. C. C. Parry collected seeds of this tree and of several other Colorado conifers and sent them to Dr. Asa Gray for distribution. In the eastern states it has grown miserably. A few of the plants raised from Dr. Parry's seeds, however, have survived, but at the end of thirty-five years are not more than five or six feet high, with feeble branches and scanty foliage. In England it appears to be more successful, and there has recently appeared in *The Garden* a description of a specimen in the Royal Gardens at Kew which produced cones last year. This tree is now twenty-five feet high, with a trunk two feet nine inches in circumference at the base, and two feet in circumference at six feet above the surface of the ground. It is as a curiosity that Pinus flexilis will be cultivated in this country and in Europe, and its chief interest and value is in its ability to flourish and produce merchantable timber in such arid regions as New Mexico, Nevada and south-eastern California.

The Park Systems of Minneapolis and St. Paul, Minnesota.

ABOUT thirty years ago what was then the little town of Minneapolis held a town meeting to consider the purchasing of twenty acres of land for a public park. The opposition to the movement ridiculed the idea that the city would ever extend far over the prairies, and argued that the town itself was then all park.

Fortunately for the still growing city, public spirit prevailed. By 1883 the sentiment in favor of city pleasure-grounds had risen so high that the Council called to its aid a landscape-architect of experience and reputation, Mr. H. W. S. Cleveland, who outlined a scheme for a system of parks, and, above all, of parkways on each side of the Mississippi River, which, if its suggestions could be fully carried out, would give the twin cities of St. Paul and Minneapolis a magnificent and unique system of boulevards and pleasure-grounds.

Upon the lines indicated, with such slight changes as were incident to the rapid development of the city, Minneapolis has worked. And though business depression and other causes have prevented the carrying out of the entire plan, an important beginning has been made by the purchase of land in desirable neighborhoods, and by securing from destruction high banks of the river below the city. St. Paul has not followed this worthy example, and seems disposed to let slip its opportunities and not yet to have awakened to the importance of handsome approaches to its parks, nor even to the crying necessity of buying land to add to them before it becomes too costly.

In 1883 Minneapolis had a population of one hundred thousand souls and a park area of about eighty acres, all told. But the far-seeing policy of Mr. Cleveland was designed to meet the needs of seven times that number of persons. The present park area of Minneapolis, though less than the original scheme provided for, is nearly 1,553 acres, including twenty-three and a half miles of parkways and boulevards. A riverside park has been laid out, and also a strip along the well-wooded eastern bank of the Mississippi has been secured. A fine drive is thus afforded and a park frontage of two miles along the river. It is possible that there may be ultimately a boulevard along its shores to Minnehaha Park, extending south to the military reservation of Fort Snelling; and a recommendation has been made that Lake Amelia be purchased for use as a reservoir to hold the surplus water of the rainy seasons for the use of the Minnehaha Falls during seasons of drought. It is the effort of the Park Commission to secure the west bank of the Mississippi also for the people, and to obtain permission to hold the picturesque region to the south between Minnehaha Park and Fort Snelling, owned by the United States Government.

In addition to the river frontage, Minneapolis has secured on the opposite side of the city a fine chain of lakes, some surrounded and others skirted by parkways. Lake Harriet has an extent of 353 acres, and the Lake of the Isles covers a hundred acres.

Generous donations have been made by public-spirited

citizens, fifty-seven of whom have given land for public use. Of the $2,250,000 that the Minneapolis parks have cost up to this time, a million has been contributed by citizens, who either gave the land outright, or continue to pay for it in yearly installments of ten per cent. for ten years. The schedule of parks for 1896 enumerates forty-eight different parks and city squares, ranging in size from a fraction of an acre to nearly two hundred acres, and there are plans on foot for a still greater extension of the system. Elaborate reports are yearly published containing photographs which show the charms of the reservations, and it is the aim of the Commission to rival Boston in the extent and beauty of the pleasure-grounds. Playgrounds for the children are not forgotten, and the water frontage affords admirable opportunity for sports of all kinds in summer and winter, boating and skating alternating with each other in making the region of the lakes attractive to the young, while electric cars render the grounds easily accessible.

Though the resources of the city have not been large enough to greatly develop its system, the authorities have wisely expended them in securing land in different parts of the town while it could be bought at a moderate price, trusting to the growing feeling of the importance of parks to enable them to care for the property as it deserves.

The parks of Minneapolis fortunately possess such beauty of lake and river, wildwood and glen, that even in their undeveloped state they are full of attraction. The banks of the Mississippi on both sides for some miles below the city have a height of 150 or 200 feet, and are even precipitous in places. These banks are covered with a magnificent growth of trees and shrubbery. Elms, Oaks, Lindens, Ashes, Buttonwoods, Cottonwoods, Birches, Cherry, Willows and Hornbeam are found there, interspersed with fine specimens of White Pine and an undergrowth of flowering shrubs similar to those of New England. Little rivulets and springs abound, and on the eastern side two or three natural cascades tumble over the rocks, one of which, known as the Bridal Veil, has a peculiar loveliness.

One can take a train or a river steamer from Minneapolis or St. Paul to Minnehaha Park, situated at the junction of the stream of that name with the Father of Waters, and find there a wild sylvan region of one hundred and twenty-five acres in extent, containing the famous silvery waterfall which hurries over the stratified rocks into the glen below, amid a surrounding of picturesque wooded hills, green meadows and running brook, "a New England picture set in a prairie frame." The slender branches of the trees nearly meet above the rushing stream, here and there crossed by a rustic bridge, and the "Laughing Water" dashes into spray over its stony bed after leaping headlong from the cliff. In winter the great ice columns and bowlders heaped high with snow have an impressive aspect, and at all seasons the glen and the waterfall are beautiful. From this park, Minnehaha boulevard, a broad avenue comprising nearly two hundred acres, leads to the chain of lakes which bounds the city on the west. Parks and parkways abounding in trees connect these great sheets of water, and another handsome parkway at the northern end leads back into Minneapolis. Thus the city grounds are provided with easy and desirable approaches from both directions, and electric cars furnish transit for those who cannot drive to them.

The lake parks are visited more frequently than any of the others, and though the improvement of the driveways is still incomplete, the outlooks over the wide, blue expanses, and the noble opportunities afforded for all sorts of water sports, make them very popular and of untold value.

Minneapolis is situated on level ground, but St. Paul is built mostly on the high bluffs of the winding Mississippi, whose valley, from Minneapolis down past Mendosa and Snelling, through the city, averages half a mile in width. No better site exists for a grand street than Summit Avenue, and no lovelier views can be found anywhere than those from the Indian Mounds Park and the proposed river boulevard, but St. Paul does not show such evidences of forethought as distinguish its active rival. Mr. Cleveland's plan suggested beautifying St. Paul as well as its sister city, but the latter seems disposed to allow its unrivaled advantages of situation to slip away from it, and no permanent provision has yet been made for taking care of even its present inadequate system of parks. Since 1894 it has depended on the precarious appropriations made by the Common Council, and barely enough is raised yearly to take care of its existing parks, only one of which is of real importance as to size, Como Park, which contains 396 acres, the remaining portions of its 453 acres being parceled out into twenty-eight small ones.

Money is expended annually on floral monstrosities, such as the Globe, the Elephant, and Gates Ajar, which might far more profitably be employed in permanent improvements. Meanwhile a plan for the acquisition of a tract on the western shore of Lake Phalen to provide a park and boulevard with exceptional water privileges has been before the Board of Public Works for years. This is a desirable area of 129½ acres, and an assessment for its purchase was completely made out last fall, but revoked again in the month of March, 1897; and, moreover, the superb site of the park of Indian Mounds, commanding a wide and varied prospect, and which consists of seventeen acres enclosing the curious tumular antiquities from which it takes its name, has never been enlarged, though the adjacent vacant blocks could now be purchased at a a very low rate, much to its advantage.

If these three parks (Como, Phalen and Indian Mounds) could be put on a proper footing and enlarged to the requisite dimensions, the present needs of the city would be reasonably supplied, though it is a pity to lose time before securing the land on the western bank of the Mississippi for future parkways, such as Minneapolis is provided with already.

The approaches to Como Park are unsightly and inconvenient. An avenue eighty feet wide was originally designed to give access to it, but no improvements according to the original plan have been carried out, and the street is disfigured by a street railway running through its centre. The City Council only last year refused to appropriate the small sum necessary to make of this a suitable parkway, with tracks laid in turf on each side. Other plans on foot for public avenues may be some day perfected, but the original magnificent idea of a river boulevard, running seven and a half miles to the Minneapolis line, embracing an uninterrupted panorama of picturesque views along its whole length, has never been carried out, though the land expense would now be very moderate, and the Park Commissioners reiterate their appeals for its purchase.

Lake Como and the Phalen-Gervais group are the extreme southern part of the galaxy of lakes which spangle Ramsey County. Noble scenery studded with other lakes lies due north of these for nine miles, the addition of which to its park system would be greatly to the advantage of the city and its people.

There are 102 acres of water in Como Lake, which has two winding tributary basins in addition to its larger surface. Around this lie over two hundred acres of land with fourteen miles of driveway and twenty-two miles of walks. A heavy natural growth of Oaks shades the region, which is densely wooded in parts, and in others diversified by open lawns, the whole affording a delightful resort. Four hundred and fifty thousand visitors were carried to this park in the summer of 1895 by the electric line alone.

Phalen is a natural park consisting mainly of native forest surrounding 450 acres of water surface, and the plan of improvements contemplates the deepening and widening of a small stream a little over a mile long which connects it with Lake Gervais, so as to make a slack-water channel for boats and motor barges, which would open a nearly four-mile stretch of water promenade through the beautiful scenery of the lakes and intermediate valley. It is a pity that provision for securing the land and for carrying out the

unrivaled system of boulevards and avenues should not be made before the opportunity is lost.

Hingham, Mass. *Mary C. Robbins.*

L'École Nationale d'Horticulture de Versailles.

IN connection with the interesting discussion on Horticultural Education with which several correspondents have been enriching our columns, the following sketch of the great horticultural school of France will, we hope, be considered timely. It was prepared for *The Gardeners' Chronicle* by Jules Gachelin, once a student at Versailles:

The National Horticultural School of Versailles is situated in the grounds of the late "Potager du Roi Louis XIV.," which was established in 1678 by De la Quintinye, inspector-general of the Royal Gardens, in the reign of Louis XIV. Although the grounds and conditions were not very favorable to work upon, he distinguished himself by producing a real "chef d'œuvre" where everything could be grown to perfection. The story says that the king would have asparagus in December, radishes and lettuces in March, strawberries in April, peaches in May, etc., and that he had them, which at that time was a very rare thing.

The glass-houses, where all the fruit, vegetables and flowers were grown, have now been replaced by better ones, but the shape of the garden, with its fine terraces and walls full of beautiful fruit-trees skillfully trained, is the work of this venerable gardener, and there are still a few big Catillac Pear-trees which are supposed to have been planted by his own hands, and which bear every year a heavy crop.

Until the first days of the Third Republic, all the produce of these gardens was used to supply the tables of the sovereigns; and it may be said that Monsieur Thiers, the first president, made use of them up to 1873, when the National Assembly decided that these gardens and buildings should be used as the site of a superior school of horticulture where nothing should be spared to train good professional and practical gardeners.

The school was opened in October, 1874, under the directorship of the late Monsieur Hardy, formerly superintendent of these gardens. The announcement of the opening of the school gave great satisfaction throughout France and abroad, and although the Government gave an annual grant of upward of £4,000 toward the expenses of the school, and £800 a year for scholarships, help was also sent from every part of the Continent and abroad in the form of money, or in contributions of plants of all sorts. Owing to the increasing success of the school every year, the number of students is limited, the average for the last three years being 100 to 110 altogether.

The students to be admitted have to pass an examination in elementary subjects and gardening, the first six on the list receiving a scholarship from the Government of £40, unless they already hold one given by a society or province. Those who hold no scholarship of any sort, but are supported by patrons or can afford it themselves, can enter the school, provided that they have given satisfaction at the examination; any one may be admitted between sixteen and twenty-six years of age. The studies extend over three years, and are divided into two sections, theoretical and practical.

The lectures are on French, grammar, mathematics, geometry, book-keeping, surveying, physics, meteorology and chemistry applied to horticulture and agriculture; zoölogy, entomology and botany (first year, classification of plants, description of flowers, etc.; second year, anatomy of plants, flowers, descriptions of diseases, etc., cultivation of fruits under glass and out-of-doors, vegetables under glass and out, flowering plants in and out, and ornamental trees), freehand and landscape drawing and water-colors. Different rooms are used for these lectures, which are given by professors appointed by the Government. Various collections of insects, animals, flowers and fruits are open to the students, as well as laboratories in which to experiment in physics, chemistry botany, etc. There is also a field for experiments.

The practical section includes five departments; the student has to remain a fortnight in each under skillful head-gardeners. There are (1) fruit-trees; (2) fruit-trees under glass, and forcing-houses where are grown Grapes, Peaches, Strawberries, Figs, Melons, Pineapples, etc.; (3) hot-houses and propagating-houses; (4) outdoor and soft-wooded plants—a botanic garden, where all sorts of medical and economic plants are grown and carefully labeled; (5) the kitchen garden, where are grown vegetables, forced and outdoor. At the end of every fortnight each student has to report upon his work. In the summer there are frequent excursions made to the chief nurseries or principal places, where the students see the best ways of cultivating various plants; and they also attend the horticultural conferences, which are given occasionally, and the shows.

There are two examinations every year; one at Easter to show the student what tasks he has to work at, and one in July to class them for the year; besides these, the professors question the students at intervals throughout the year. Each student has to obtain a certain number of marks to be able to pass through the second year's course; those who do not attain them are declared unable to continue their studies, and leave the school. At the end of the three years they pass a general examination in every branch, theoretical as well as practical, and if they give satisfaction, a certificate is awarded them, and the first two obtain a scholarship from the Government, enabling them to pursue their studies abroad.

Every year the director receives from all parts of the Continent and abroad applications for men to serve as directors of botanic gardens and town gardens, for head-gardeners, superintendents of colonial gardens, professors in schools and horticultural societies; and I may say that some of the most important positions in France and in the colonies are filled by ex-students of Versailles, not to mention those abroad. From Hungary, Roumania, Spain, Portugal and Germany, every year a good many persons come for the same purpose as do the others, to improve themselves at the school; and English, Belgians, Turks, Russians, Japanese, Swiss, Italians, Spaniards and others are found among the students; and they return benefited by the experience gained in the National Horticultural School of France.

In conclusion, I may mention that there is an association formed by the students, which publishes a yearly bulletin which keeps a record of the position of the members, and includes articles on various subjects of interest, including the experiments made at the school during the year.

Foreign Correspondence.

London Letter.

Spring Gardening in London.—The tendency of garden art in England now is more in the direction of the natural style than ever. The crusade against summer bedding arose not so much from a dislike for the plants used as from an objection to their misuse in the production of gaudy formal patches of color. We have summer bedding still, but the plants are grouped more after nature's plan, and if a bed of scarlet Geranium or purple Heliotrope is employed it occurs in a position where the effect is good and artistic. The form of the bed is often the cause of its failure to please. If we could do away with the circular, kidney-shaped, crescent-shaped or rectangular bed, and substitute an irregular piece of broken ground, to be ultimately covered by leaf and flower, our gardens would be greatly improved. In any case the geometrical star, or crescent, or monogram form is generally offensive. The prevailing practice among the best gardeners here is to use masses in beds generally round, but with its outline broken as much as convenient by the irregular growth of the plants in it. Only one kind of plant is used for each bed, unless a second one be employed for a double purpose, as, for instance, Pansies under Roses, or Lilies with Rhododendrons. The multicolored bed of Geranium, Heliotrope, Coleus and Lobelia, so popular twenty years ago, was only an exaggerated form of what is bad taste in color mixing.

What is true of summer bedding applies with equal force to the case of spring gardening—that is, to the use of hardy early-flowering bulbous plants for floral display out-of-doors. One has only to compare the beds in the terrace garden filled with regularly placed Hyacinths, Tulips and Daffodils with the effect produced by the same plants when planted broadcast, as it were, in bank or glade, or by the water-side. Sir Watkin, Emperor, Empress and Poet's Narcissi are attractive anywhere, whether in bed or flower-pot, but their grace and charm are nowhere so evident as in the grass glade or slope, or in irregular groups on the lawn. A bed filled with Crocuses is pleasing until one has seen a grass slope studded with them. Tulips and Hyacinths are also much more effective when grouped "any how" on the grass slope or in the wild garden than when trussed on the regulation coffee-colored flower-bed. The present

spring has seen an enormous development of bulb gardening in the parks and public gardens of London, and in almost every case the difference between the wild garden and the formal bedding styles is displayed by a liberal use of both. In some cases the attempts at the more artistic style is a failure through faulty planting, either by sticking the bulbs into the ground at equal distances apart, or by planting them in positions where they are out of harmony with their surroundings. Such attempts bring the wild-garden style into ridicule. As a matter of fact, much more art is needed for the production of a pleasing wild garden, so called, than is commonly supposed. To so arrange tree and shrub and herb and grass as to produce a pleasing natural effect requires knowledge and taste of no mean order. It is quite true that many so-called attempts at natural gardening deserve the sneers of such authorities as Mr. Inigo Thomas, who calls them wildernesses, not gardens.

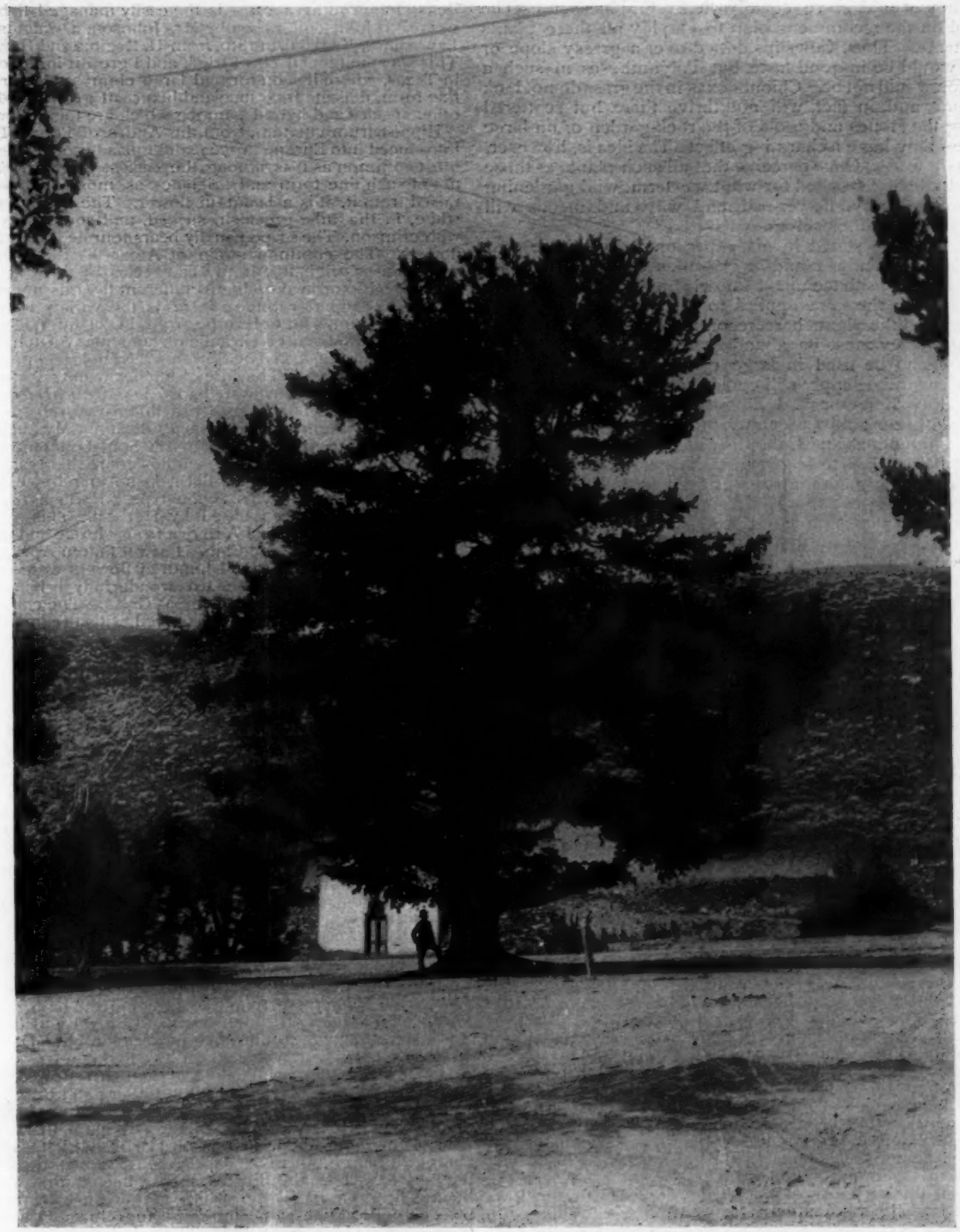

Fig. 19.—Pinus flexilis in the Yellowstone National Park, Wyoming.—See page 162.

The plants used here for spring gardening are generally of the commonest and cheapest character—Daffodils,

Hyacinths, Tulips, Crocuses, Snowdrops, Chionodoxas, Anemones (blanda, apennina, hortensis, nemorosa), Cyclamens, Winter Aconite, Christmas Roses and other Hellebores, Primroses, Cowslips and Polyanthuses. If we could obtain Irises of the reticulata section, the big Saxifragas, Adonis, Leucojum and Erythroniums in sufficient quantities they would serve equally well. Emphasis must be placed on the recommendation to employ all these plants with taste. Thus, Cowslips dotted over a grassy slope or lawn would be in good taste, but Polyanthuses in such a position would not be. Chionodoxas in the grass do not look at home, and, in fact, will not thrive there, but scattered among the stones and roots of the rock-garden or on large borders they have a charming effect. The idea is, however, the main thing. Once perceive that all such plants as those named are better suited for what we term wild-gardening than for the formal flower-bed, and ways and means will readily suggest themselves.

Mr. Burbidge stated in his paper on bulb culture that Daffodils and Tulips could be grown as easily as Potatoes, given the requisite technical knowledge and suitable soil and climate; the same applies to the cultivation and increase of all the plants here recommended for spring gardening. They must be abundant and cheap before they can come to be used in large quantities, but given the demand and the supply will certainly come. It is not many years since Emperor and Empress Daffodils were worth pounds a dozen; now as many pounds will buy a thousand. Chionodoxa and Galanthus Elwesii used to be doled out in small packets to be grown with care in the flower-pot; now one can buy them at so much per bushel. Still, even now we cannot get enough of them. When people see the effect such plants produce at Kew and in other gardens when used in quantity they have the desire to reproduce this effect in their own gardens. I believe there is a great future for all easily grown plants which flower freely and are effective in the open air in spring. Horticultural taste, in England at any rate, leans in that direction.

London. *W. Watson.*

Cultural Department.

The Hippeastrums.—I.

SPECIES AND VARIETIES.

I BEGAN to cultivate Hippeastrums in 1881, and since that time I have added new material from year to year. Although the hybrids are much more striking than the species, I have collected as many of the latter as I could get from dealers and from collectors in tropical America. In many cases I did not succeed in obtaining the true species from their native home. I obtained many species from southern Brazil, British Guiana, Venezuela, Central America and the Lesser Antilles. From the mountains of the Andes, particularly in Peru and Ecuador, where some of the most beautiful species grow, I have as yet been unable to procure material.

All these plants are known popularly as Amaryllis, while in science they are called Hippeastrum. The true scientific term Amaryllis belongs to the Belladonna Lilies of south Africa, which have very similar flowers, but different bulbs, leaves and seeds, the latter being few, large and fleshy, while the seeds of the Hippeastrums are many, flat and light, and can be carried away easily by the wind. All the Hippeastrums are strictly American, being found in the tropics from southern Mexico southward to Paraguay and Buenos Ayres. Hippeastrum equestre has been naturalized in southern India and also on several islands of the Indian Ocean, and the true Amaryllis Belladonna (Belladonna Lily) of south Africa has been detected in the island of Jamaica and also on the Andes of Colombia, on the banks of one of the branches of the Rio Cauca, where it was found by Monsieur André, who supposed he had discovered a new species of Hippeastrum. In *The Gardeners' Chronicle* of 1880 it was described and named after its discoverer, Hippeastrum Andreanum. Only recently it has been ascertained that this is the true Belladonna Lily escaped from cultivation.

It is a singular fact that all the Amaryllis are called Lilies by persons with no knowledge of botanical science. Thus, Johnson's Amaryllis is known in the south as the Red Lily; Hippeastrum equestre as the Barbadoes Lily, etc. But the name of the nymph Amaryllis has been connected with these plants since the days of Linnæus, and is almost as much a part of the modern languages as Lily, Tulip, Hyacinth or Magnolia. The comparatively unpoetical term Hippeastrum, Knight's Star, will probably never find favor with the general public.

The Amaryllis which is most commonly met with in the gardens of the southern states is the easily managed hybrid Hippeastrum Johnsonii, raised by Mr. Johnson, a watchmaker at Lancashire, England, in 1810, from H. Reginæ and H. vittatum. This was the first species I tried, and I grew it in the open air in Texas, where it soon formed large clumps. Its brilliancy, fine form, delicate fragrance and luxuriant growth led me to other species and hybrids, among which are the following:

Hippeastrum vittatum, from the Andes of Peru. This was introduced into Europe in 1769, and it has become one of the most common as it is among the easiest to grow. Though not of such fine form and brilliancy as most of the hybrids raised from it, it is a beautiful flower. The ground color is white, in the tube greenish, striped, and sometimes veined with crimson. The scape usually bears four delicately fragrant flowers. The common strain of Amaryllis found in most greenhouses originated from this species by crossing it with other species, or in crossing its different hybrids among each other. Far superior to the species is the variety H. vittatum Harrisonianum, sent to Europe from Brazil by William Harrison, the introducer of H. aulicum and many Orchids from the Organ Mountains. The flowers are very large, pure white, with two red stripes. They are of fine form and substance and very fragrant. It was figured in *The Botanical Register* on plate 988. Some botanists regard this as a probable hybrid between H. vittatum and H. solandriflorum. My bulb, which was received from B. S. Williams & Son, London, does not grow very luxuriantly, although it flowers regularly in spring.

Hippeastrum equestre, the Barbadoes Amaryllis, Barbadoes Lily, or Orange Lily. This is the type on which the genus Hippeastrum has been based by Herbert. This species is found throughout tropical America from Mexico and the West Indies south to Brazil and Chili. I saw it first in April, 1886, in south Florida, where several hundred flowers were standing close together and produced a wonderfully brilliant effect against a background of tall Pampas Grass. The color of the large open flower is a bright orange-red, with a yellowish white star in the tube. Two to four flowers are usually borne on a scape fifteen to twenty inches high. The strap-shaped leaves, of which six to eight are produced by each bulb, are about eighteen inches long, of a glaucous-green color. As the flowers appear when the plant is in full foliage, the effect is indescribably striking. I have seen clumps consisting of fifty bulbs, almost all of which were flowering. In the greenhouse I have had bulbs of this species from Florida, Barbadoes, St. Vincent, Jamaica, Nicaragua, Venezuela, British Guiana, Honduras, southern Brazil, etc. They vary a good deal in size as well as in the brilliancy of their flowers. Those from St. Vincent, belonging to the variety H. equestre major, are the most easily grown, the most vigorous and brilliant. H. equestre Roezli, gathered by the celebrated collector in the Andes of Bolivia, has a lighter color and smaller flowers. H. equestre pyrrochroum appears to be entirely different, having much stronger roots, more robust leaves and scarlet flowers with a greenish centre. This is by far the easiest grown of all the H. equestre tribe. There is also a semi-double variety which I received from St. Vincent. H. equestre flowers freely for the first year and the leaves grow normally, but when the winter sets in, if it is kept moist, the roots rot and the bulb soon follows, and if kept dry the bulb begins to shrivel and decays in the inside. The few bulbs that may remain sound are only with great pains restored to a healthy condition.

Hippeastrum Reginæ, a native of southern Mexico, Central America, the West Indies and south to Peru and Brazil. This is one of the most beautiful of Amaryllises. Introduced into cultivation in 1728, it was called Lilium Regium by Dr. James Douglas in honor of Carolina, wife of George II. It is a strong plant, with large, massive, dark green glaucous leaves. In their earlier stages the flowers show a deep purplish brown hue. The strong scapes, of which two are usually produced by each bulb at the same time, are four-flowered and from twenty-six to thirty inches high. The flowers are large and of a very brilliant orange-scarlet color. Each segment has a broad white stripe in the centre extending two-thirds of its length from the base. The tube is greenish. It is easily grown, and flowers better in the window than in the greenhouse, and really most Amaryllis do better with amateurs than with florists. This species has been fruitful in the production of hybrids; the first known cross, H. Johnsonii, having been

raised from it. It multiplies rapidly by offsets, which cannot be said of many others. There is also a double form known in cultivation as H. Albertii.

Hippeastrum psittacinum, the Parrot Amaryllis of southern Brazil. This was introduced to European gardens in 1814. Although not a showy species, it is interesting on account of its peculiar flowers. It has been frequently used in raising hybrids. One of the most robust Amaryllis now in cultivation, the brilliant Empress of India, was raised by Mr. de Graaf, of Leiden, by crossing this species with the hybrid H. Gravianum. It is a strong-growing species with stout flower-scapes two to three feet high, each bearing from two to four large flowers of a greenish ground color, beautifully veined, penciled and margined with bright crimson. Although of a robust constitution, it is easily lost in the greenhouse if its requirements are not carefully met. If watered thoroughly only a few times in winter when at rest, or if kept in a moist or damp place, it invariably rots. The variety H. psittacinum major has larger flowers than the common form. It produces its flower-scapes before or contemporary with the long strap-shaped leaves. This species, as well as H. vittatum and H. Reginæ, I have obtained true to name and in best flowering condition from Mr. E. H. Krelage, of Haarlem, Holland. I have found that these bulbs which have been thoroughly acclimatized do much better and give more satisfaction than those imported directly from their native country.

All the species so far considered are deciduous—that is, they have a season of rest when the leaves die down, and a season of growth. They must be kept entirely dry during winter and should only be watered when the flower-scape or the leaves have grown a few inches high, and then only cautiously, once in a week being enough until the leaves or the flower-scape are almost fully grown. If the drainage in the pots is perfect, they require much water when in full flower and foliage. As soon as the leaves begin to die down water must be withheld almost entirely.

Hippeastrum aulicum is an evergreen species of very robust constitution. It was introduced to cultivation from the Organ Mountains of Brazil in 1819. Mr. Harrison, its discoverer, found it abundantly in the rich vegetable mold on shady mountain-sides. The peduncle grows from eighteen to twenty inches high, bearing an umbel of two flowers of a very rich, deep, velvety crimson, appearing as if covered with gold dust; the centre is green and the form of the flowers not good, compared with our modern race of Amaryllis hybrids. The flowers appear invariably late in the autumn or early in winter. From this magnificent species many fine hybrids of special merit have been raised, among which H. Ackermanni pulcherrimum, one of the most glowing, was obtained by crossing it with H. Johnsonii. H. aulicum is easily grown and flowered if care is taken that the leaves are kept green. Water must, therefore, never be entirely withheld, as the plant is evergreen. A more satisfactory and more easily grown form of this noble species is H. aulicum robustum (H. Tettani, H. Rougieri), which was introduced from the German colony, Blumenau, south Brazil, by Dr. Blumenau in 1848. Under the name of Amaryllis Tettani large quantities were sent to Berlin and Erfurt. The foliage is very robust, being densely speckled with minute purplish spots on the underside. The two flowers are of a deep crimson with a green star. The bulbs multiply rapidly by offsets, unlike those of the type, which are slow in this respect. The variety H. aulicum platypetalum has broader segments and a larger green star, and another variety, H. aulicum stenopetalum, has narrower segments than the type.

Milwaukee, Wis. *H. Nehrling.*

Notes from Baden-Baden.

AMONG Muscari I beg to mention the variety Freynianum of M. azureum, which is the best of the three varieties; its spikes are the largest and the flowers are the best in color, a bright turquoise blue. It flowers early enough, being in bloom here from the middle of February to the middle of March. A little later comes another handsome variety, M. Szovitsianum subcœruleum, with robust and showy spikes of pale sky-blue. Soon after M. polyanthum shows its large deep blue spikes in great abundance, as it flowers more freely than any kind under cultivation, and is also very showy. M. elegans is another gem among these spring flowers; its rolled leaves and the uncommonly long narrow spikes beset with comparatively large individual flowers of deep ultramarine distinguish it as a very showy plant.

Tulipa Kaufmanniana is among the earliest of its tribe, and its varieties Aurea and Pulcherrima are, perhaps, the most gaudily colored and largest-flowered Tulips. Both have outside segments of intense, slightly glaucous scarlet encircled by a broad orange-yellow rim; inside they are of a very deep brilliant yellow, with a few scarlet streaks and blotches. T. suaveolens is another striking species; the large flowers are all over a deep crimson-scarlet. This species seems to be very rare, and the true plant is scarcely met with in the trade.

Baden-Baden. *Max Leichtlin.*

April Irises. (Bulbs)

BETWEEN the flowering of the early-blooming Irises and the first of the rhizomatous section, say, usually from late March to late April, there are a few interesting species which are as distinct as they are attractive. These Irises all belong to the Juno group of the botanists. In a general way they are distinguished by having bulbs with a few thick scales, very thick fleshy roots, which are formed before they go to rest and by the exceedingly small standards of their flowers. They have leaves somewhat Leek-like, stem-clasping and distichous. Some of the Juno group flower in the early winter, and are grown under protection in winter, but the main body is in evidence at this season. Owing to their hardiness and distinct habit, so different from other sections of the family, they may be considered very desirable plants for the hardy border in certain positions. They are bulbous plants, natives of Asia and localities where the seasons are somewhat sharply defined into wet and dry periods. Different plants from the same locality will grow under differing conditions, as some of them have a certain adaptability to unaccustomed environments, but in a general way the proper treatment of deciduous bulbous plants, natives of countries having very dry seasons, is to supply them freely with moisture as soon as they start into growth and as long as they continue to make progress, and to withhold water as soon as indications show that growth has stopped, keeping them as warm and as dry as possible during the resting season. It is difficult to imitate the conditions of a dry steppe in an ordinary garden, and it is sometimes perplexing to choose a position in the open where such plants will thrive. Raised borders, with sashes in summer, or even cold frames, are sometimes used, but these are unsightly, and usually the most available place for such plants is at the foot of a wall with a southern exposure. In such a position, however, there is usually a lack of moisture, even early in the spring, while the plants are growing vigorously, and the cultivator must be prepared to supply water when, as is often the case, the March winds dry the soil. In the garden one should use the hose when water is needed, even if the calendar indicates a wet season. Growing bulbs can scarcely be overwatered.

Of this small group of plants, Iris orchioides is the most attractive in the borders, both in flower and in the habit of the plant. It produces stems a foot and a half to two feet tall, and as the internodes and flower-stems are longer than those of other species it is more graceful in habit, while the abundant golden-yellow flowers, though individually small, are very effective. In somewhat heavy soil, and a southern exposure, near a wall, I. orchioides flowers regularly here, increases by offsets and bears seed. It would probably be well to lift, remove the offsets and replant it at least every second year as there is a tendency of the plants to become too crowded for the best results. The yellow of the flowers of I. orchioides is accented by a black blotch on each fall.

Flowering at the same time is a blue-flowered Iris from Bokhara and Turkestan, I. orchioides, var. cœrulea. Though this has the long internodes and stems of the type it is scarcely as graceful. The flowers are larger than those of the yellow form and are a light slaty-blue shading to white, with a bright orange ridge, on each side of which appear deep blue linings. My experience with this form is slight, and I do not know how reliable it is as a border plant. Two years ago I had from Rev. Mr. Gates, of Mardin, a few bulbs of what seems to have been known as I. Mesopotamica, but which is more correctly I. Assyriaca, Haussk., under which name it has lately been introduced by Herr Leichtlin. This is now flowering at a height of fifteen inches. The flowers are some three inches across. The flowers were described as a milky white, but the writer must have had in mind the whiteness of city milk, for even at first the flowers have a blue tint which deepens as they age. It may be said that the flowers of these Irises open in succession from the tip downward, and usually one from each node. The nodes and flower-stems of I. Assyriaca are shorter than those of I. orchioides, and the leaves are wider and less shiny.

The prettiest blue-flowered Juno Iris, however, is I. Sindarensis, which is now in bloom. The leaves of this plant are not as smooth as those of the others, and are slightly glaucous. The flower-stems are short and the flowers rather larger and

have wider petals than those of I. Assyriaca. They are frilled on the falls and have a very pleasing slaty blue color.

Iris Caucasica and its variety major are dwarf kinds of the same section, with few narrow leaves with horny margins. The flowers are of that degenerate yellow euphoniously described by the plant dealer as "light lemon-yellow." As it is improbable that any one's color sense can be gratified by such a futile attempt at yellow, I hesitate to commend this species as a garden plant.

Iris fumosa is another yellow-flowered Juno which I have not yet seen in flower, though it is in bud in the border. This Syrian species is said to show a smoky hue of yellow which is not promising, as smoky-hued Irises usually are more curious than brilliant. These plants flower at that unhappy season when the weather is never twice alike. The flowers are indifferent to changes of temperature, like most early flowers, but they do suffer severely from the great enemy of us all—the high drying winds—so that if a sheltered spot can be given them it will be appreciated.

Elizabeth, N. J. *J. N. Gerard.*

Correspondence.

The Red Cedar.

To the Editor of Garden and Forest:

Sir,—I was very glad to see this tree recommended in your paper for more general planting in our parks and private grounds. It certainly seems strange that a tree of so much beauty should be neglected, especially in these days when our native trees and shrubs are coming so rapidly into favor. I have found it an unusually easy tree to transplant, and have moved many from ten to fifteen feet in height, with but slight loss; they should, however, be very heavily cut back when moved. In fact, I know of no tree that stands the pruning-knife so well; trees that have become badly misshapen from overcrowding can be readily made into fair specimens by the use of the knife.

Although usually we find these trees growing in rough, stony places, they respond quickly to a more generous treatment, and their annual growth is greatly improved when planted in rich soil. I had on my land some large clumps of poor Cedars, crowded together and choked by a growth of White Birches. After removing the greater part of the Birches, I thinned out the Cedars, subjecting the remaining ones to a vigorous pruning. The soil was then enriched as far as possible, and the result is that the Cedars are greatly improved, and in many cases have become good bushy specimens. The effect produced by so radical a treatment was at first undoubtedly discouraging, but after one season the Cedars had shot out beyond their amputated limbs, and the loss of picturesqueness proved to be but a temporary one. On many country places such clumps are common, and I would advise the owners to experiment on a small scale if they are fearful of the treatment being too radical, and judge for themselves.

This power of enduring the pruning-knife or shears makes the Cedar especially valuable for formal gardening, as you mention, but the true place for its use seems to be the one indicated by nature—that is, for covering the tops of rocky knolls and pastures. Almost all our large parks have appropriate places for such trees; in Franklin Park, near Boston, we have a piece of land to which they would seem to be especially well adapted. In fact, many of the hills were partly covered with old Cedars. Unfortunately, as a facing for these rough, picturesque knolls, thousands of Japanese Retinosporas have been planted, looking sadly out of place, and mostly in poor condition.

The peculiar bronze color which they assume in winter has always seemed to me to be a very beautiful one, especially when seen in connection with the bluish green of the White Pine, or when an occasional White Birch is allowed to remain to relieve the soberness of their winter hue. There seems to be, moreover, a great variety of color in the different specimens, some of them being so glaucous as to closely resemble the Retinospora squarrosa.

Farther south, in Virginia and Florida, they seem to have a looser and more feathery habit, and the tree loses the rigid upright character so common in New England. At Washington there are many fine specimens, especially at Arlington, where the steep bank of the Potomac in front of the house is covered by some splendid trees that greatly enhance the beauty of the view. In Massachusetts, however, good specimens are rare, and only occur when some tree has had the good fortune to grow undisturbed and alone in some rich pasture.

Wellesley Mass. *H. S. H.*

Horticultural Education.

To the Editor of Garden and Forest:

Sir,—I have been much interested in the discussions in your columns respecting the best methods of giving instruction in horticulture. I do not care to comment upon the various articles, nor upon the subject in general at present; but, in order to add an incidental interest to the subject, I wish to make a brief historical excursion. It seems to be true of any subject that we can never be sure of getting back to the very beginnings of it, and it is none the less true of agricultural education; in proof whereof I now append some statements and propositions made by Samuel Hartlib as early as 1651. The source from which I quote is a little book styled, "An Essay for Advancement of Husbandry-Learning: or Propositions for the Erecting a Colledge of Husbandry: and in order thereunto, for the taking in of Pupills or Apprentices. And also Friends or Fellowes of the Same Colledge or Society. London, Printed by Henry Hills. 1651." This quaint little book was placed in my hands by Hon. Andrew D. White, who recently bought it in London. The copy contains the book plate of the illustrious Arthur Young. The book is a small affair, numbering altogether only seventeen pages, and four of most entertaining introduction. This introduction is the only part of the writing which bears Hartlib's name, but the whole book and scheme are his. He asserts that it is the "Narrowness of our Spirits" which makes us miserable, and that if we were properly awakened to the advantages which lie about us "we could not be without Lucriferous Employments." Wherefore he proposes a school of husbandry. "Why may we not conclude that in the Science and Trade of Husbandry, which is the Mother of all other Trades and Scientificall Industries, a Collegiall way of Teaching the Art thereof will be of infinite Usefulness."

The things which Hartlib would teach are set down as follows:

(1.) Tillage, or setting or sowing of several sorts of Corne or Graine, for the reliefe and sustenance of man and beast. (2.) The breeding of Cattel (in which the breeding of Sheepe may seem particular). (3.) The feeding of Cattel. (4.) The Use of the Dairie. (5.) The planting of Orchards. (6.) The planting of Gardens. (7.) The breeding and feeding of Swine. (8.) The breeding and feeding of the several sorts of tame Poultry. (9.) The planting of Hops. (10.) The sowing of Hempe, Flax, or Rape. (11.) The breeding, preserving and taking of wilde Beasts, as Conies, etc. (12.) The breeding, preserving or taking of wilde fowle, particularly of Duckes in and by a Decoy. (13.) The making and managing of Rivers, Moats, Ponds, etc., for the preserving and taking Fish of all sorts for the use and sustenance of man. (14.) The planting of Woad, and all outlandish rare or extraordinary Roots, fruits or plants. (15.) The dreining, fencing, mowing and making of Grasse in Meadowes into Hey. (16.) The making of Malt. (17.) And (that now so exceeding necessary endeavour) the planting all sorts of Wood for Timber or fire. . . .

"As these are encouraged and enabled: so is a Nation more or lesse prosperous, or outwardly happy; both these in their distinct natures or uses are most excellent; and are also (at least ought to be) inseparable companions: of which if either precede it is Ingenuity; for that Industry as it is distinct from Ingenuity, can do nothing till the other have contrived what and how."

The means of securing the establishment of the institution are these:

"That whereas it is manifest, that such a Colledge or Society cannot be erected without the building or buying (at least a long lease at an easie rent, if not the inheritance) of some large and convenient House, with some good quantity of Land adjoyning and belonging to it; and it is as manifest that such a purchase cannot be made without good Sums of Money.

"It is therefore desired, that all such Well-wishers to their Countrey's wealth and prosperity; be pleased to contribute such sums to this good and laudable Worke, as in their own Wisdomes and bounties appear necessary, and deliver the same into the hands of Mr. Samuel Hartlib, whose abundant Zeale for the Publique Good, renders him most worthy to be entrusted therewith, till there shall be a competent Stock obtained for the setting forward of this great and good Worke before mentioned: And to subscribe their Names and Sums; that so the whole Society (when erected) and the whole Nation (when in due time they shall have tasted the sweet effects from hence proceeding) may know to whome to render all due thanks through all Ages, as to the bountiful Promoters of; by contributing to a Designe so much conducing to the good of the present and Prosperity of all Ages to come: a Plentifull Reward to every Noble Spirit.

"It is therefore Offered, that whosoever shall disburse and engage any sum, for the encrease of that Stock, and consequently the imployment of the Society: shall by an unerring, unaltering rule, receive yearly; while his money remaines in the hands of the said Colledge, for every 100. pound, 20. pound, and so for a greater or lesser sum proportionably. And if any particular Person shall desire to have his sum disbursed, to be imployed in any one particular single part of this copious Art here before mentioned; he shall have his desire fulfilled: provided that his Stock be sufficient to drive on that way; and that he be contented to forbeare his revenue till nature hath produced the returne.

"And whosoever shall thus engage, shall at any time (upon six moneths warning given) call in and again receive his sum formerly disbursed.

"And all those that shall thus engage, are desired to enter their Names and Sums, by subscribing and delivering the money into the hands of Mr. Samuel Hartlib. And for Security they shall have; As to Law, the Propounders bond; As to Love, the word of him that desires to prove himselfe a just and honest man, to God and man, (to his utmost power) and to all Engagers a faithful Steward."

Having founded the institution to his satisfaction he would next proceed to secure pupils or apprentices; and these were to be attracted by the following plan:

"If any Person of quality have a Son or Kinsman 15. years old or upwards, with whom he will give (besides well-suiting him with all necessary wearing apparel, and more, to the value of twenty marks; in such other necessaries, as the Undertaker shall appoint) 60.l. in ready money at his first Entrance, and bind him Apprentice for seven years; he shall be in that time faithfully instructed in both the Theorick and Practick parts of this (of all others) most Auncient, Noble and honestly gainfull Art, Trade or Mystery. And at the end of that time, he shall receive at one entire payment, to set up withal, 300. pound. And shall for foure years next ensuing the end of the said 7. years, receive at the end of every year 100. pound more; the better to support him till he have taken sufficient root." . . .

"Into this Colledge also any man may enter himselfe as a freeman, or Friend to, and Member of the Society; upon the following conditions.

"(1.) He must pay down at his Entrance 50. pound, as given to the Society for the encouragement of Ingenuity in the practice of Experiments, for the obtaining of yet more perfection in this (almost) infinite Science.

"(2.) He must bring with him some skill, at least Ingenuity; and testifie himselfe to be a Well-willer to the profession and professors of Good-Husbandry; and particularly to the Master and Fellowes of this Society.

"(3.) He must produce at least 250. pound as a Stock to set up for himselfe, to be driven by himselfe, according to the best direction and assistance to be given by the Master and Fellowes of the Colledge.

"(4.) He shall (not swear, but) subscribe himself under hand & seale, a faithful Seeker of the Advancement of the Mystery and Society; and to be aiding and assisting, to the Master and the Fellowes to his power, at all times, and in all cases, (his own interest always preserved), and to consent and submit to all such Orders, as shall be from time to time made, by the agreement of the Master and the Major part of the Fellowes of the said Colledge, for and concerning the same Society, and to stand to their Award in any case of difference: And not directly or indirectly to discover all or any part of the same Art or Mystery to any person whatsoever, upon any pretence whatsoever, without their consent first had and obtained.

"(5.) He must be alwayes in Commons at the Hall of said Society; at the rate of 8.s. per week, or such other rates more or lesse, as the then present state of things shall require. And he is alwayes to pay off all arreares at the end of each moneth at the farthest, without any deductions for absence how long or short soever. But if he keep a Servant (who must also be in Commons when present) he shall be allowed to deduct for his absence. As also he is not to be accomptable to the Stable for his Horse when absent.

"(6.) He shall at his first Entrance, pay for Himselfe 10. pound, for his Servant 5. pound, for his Horse 40.s. for their habitation: besides providing of all necessary furniture; but be ever after free till death or departure.

"(7.) Lastly, he must be a single man; and if he shall at any time marry, he is from thenceforth to be accompted dead to the Society, to all intents and purposes whatsoever; save onely in point of debt or discovery."

These propositions seem to have been made public before the date of the volume before me, for, toward the close of the book, the writer again addresses his reader personally and complains of the "Backwardnesse of men" to join with him; and he then resolves the objections which have been urged against the scheme into three categories:

"First, the supposed Impossibility of performing (on my part) the thing promised.

"Secondly, the Newnesse of the Invention or Contrivance, which renders it within the list of things Inspected.

"Thirdly, the Non-appearance of any such good Security as is held sufficient to encourage men to joyne with me freely, fully and speedily (that is, seasonably)."

To these he made answer, and seems to be somewhat impatient that the scheme should not at once arise into fulfillment. How blessed was Hartlib that he had no prevision, and could not know the long travail of two centuries which lay between him and the agricultural school!

Who was Samuel Hartlib? He seems to have been the son of a Protestant Polish merchant who had fled to Prussia to escape persecution. Hartlib emigrated to England about 1628, and died there about 1670. He identified himself with the literary and educational life of his time, and also wrote profusely of agriculture and religion. He was the friend of Evelyn, Pepys and Milton, and the latter dedicated to him, with much praise, his treatise upon education. He appears to have been one of the group from which the Royal Society sprung. There is record that he spent much of his income in helping indigent scholars, and he finally became so straitened in circumstances that Parliament granted him a small pension. He seems to have been a most benevolent and honorable character, and to have enjoyed the full confidence of his contemporaries. No less than twenty-two books are known to have been written by him, of which the one under consideration seems to have attracted nearly or quite the least attention. There seems to be no record that his desire to found an agricultural school ever came to tangible results; but it would not be strange if this little essay upon "Husbandry-Learning" should, after all, be the chief means of carrying Hartlib's name and life to future generations.

Cornell University. *L. H. Bailey.*

Recent Publications.

Nature in a City Yard. By Charles M. Skinner. New York: The Century Co. 1897.

That any one who deliberately and avowedly writes about nature should be compared with Thoreau is inevitable. It is not surprising, therefore, that the publishers of this neat little book send out with it a slip in which some critic is reported as saying that one can get a good idea of Mr. Skinner's work by imagining Thoreau transported from his home in the woods to a densely populated city and compelled to substitute a Brooklyn back yard for his beloved Walden Pond. Mr. Skinner himself would smile at this comparison, for he does not pose as a poet or a mystic or a profound philosopher. He writes simply like a man of merry fancy with a keen habit of observing the surface of things. He makes no pretense of being an authority on entomology or botany or horticulture, and yet he says many interesting things about insects and their ways, and about plants and their cultivation. He makes no labored attempt to evolve a moral here and there or establish recondite analogies between the processes of the physical and spiritual universe. His essays, which are not without a delicate humor, ripple along in a stream of refined comment upon ordinary city sights and sounds, with nothing to mar their simplicity and grace except an occasional effort at fine writing. The book is neatly printed and has an attractive cover which will harmonize well with the furniture of a shady piazza on a summer afternoon, and the loiterer who picks it up for a half-hour's recreation will not be disappointed.

Notes.

Catawba grapes are still seen in some of the fancy-fruit stores and look as fresh as when gathered six months ago. A box holding three pounds sells for fifty cents.

During last week 5,242 barrels of pineapples came from Havana to this port. The entire output from Cuba will amount to from 100,000 to 125,000 barrels this season, about half the usual yearly export.

The New Hampshire Experiment Station finds that the varieties of potato which have received the highest commendation from all sections of that state are White Star, Rural New-Yorker No. 2, American Wonder, Carmen No. 3, Governor Rusk and Sir William.

More than one of the English horticultural papers have spoken this year of the good qualities of the white-flowered form of Daphne Mezereum, and a correspondent from Wellesley, Massachusetts, writes that it is strikingly handsome there this spring, having been in full flower a long time, and much more beautiful than the common one with magenta flowers. This plant ought to take high rank among our early-flowering shrubs.

Apples are still plentiful, 16,000 barrels having reached this city last week for the local trade, besides about 2,000 barrels for export. Northern Spy and Ben Davis bring the highest prices, with Baldwin, Roxbury Russet and Golden Russet in fair demand at somewhat lower rates. The receipts in New York city at this time last year amounted to 681,002 barrels, while in the exceptional season now ending 1,330,221 barrels have been sold here.

The third number of *Florilegium Harlemense* contains pictures of the light rose-colored single Hyacinth, Gigantea, a plant of unknown origin which appeared first some sixteen years ago; three single early Tulips, Chrysodora (yellow), Canary Bird (Kanarievogel), the white L'immaculée and the dark purple Wouwerman—all good varieties for forcing or outdoor planting; and the large and somewhat coarse Crown Imperial known as Maxima.

In regard to the complaint that Red Cedars grow slowly, a correspondent writes that some small trees planted at Radnor, near Philadelphia, some seven years ago, have grown in height considerably more than a foot every year, while some larger ones planted near have spread out rapidly into bushy specimens. It is to be noted that these trees were set in rich moist soil near water, and this indicates that the Red Cedar is not at all ungrateful for good treatment.

A series of lectures and field-meetings, for the purpose of supplying popular instruction about trees and shrubs which grow in New England, will be conducted at the Arnold Arboretum during May and June. The instruction will not be technical, and the purpose of Mr. J. G. Jack, who will conduct the lectures, is to indicate easy means of distinguishing the common native trees and shrubs and recognizing the foreign species which have been introduced. Applications and further inquiries should be addressed to Mr. J. G. Jack, Jamaica Plain, Massachusetts.

A correspondent of the April number of the *Orchid Review* writes of a specimen plant of Dendrobium nobile at Hollin Hall, near Bradford, England, which is carrying 1,134 fine flowers. Five years ago the plant was in an eight-inch pot, half-starved, and the bulb did not measure more than ten inches in height. It is now in a fourteen-inch basket, measuring three feet in diameter, and the longest bulbs are four feet six inches high. The success of Mr. Moorby, the gardener, is due to top-dressing every year with fresh sphagnum and peat, which keeps the compost fresh and sweet. Another important cultural point is the resting of the plants at the proper time by withholding the water gradually and never allowing them to shrivel.

The cold weather last week injured vegetables in Maryland and Virginia, and the asparagus, pea and bean crops were affected even in North Carolina. As the season for some sorts is waning in Florida, and these same kinds are not yet coming from the more northern Atlantic coast states in sufficient quantities, prices for new vegetables are high. For example, cucumbers, from Florida, sell at the rate of three for twenty-five cents; tomatoes, from the same state, at twenty-five cents a pound, and peas, the main supply from South Carolina and Georgia, with the first pickings from North Carolina, at seventy-five cents a half-peck. Asparagus costs forty to fifty cents a bunch. Even French artichokes cost more now than during winter, and bring thirty cents each. Bunches of a dozen or fifteen small carrots cost twenty-five cents; other young and tender vegetables are kohl rabi, beets and onions. Choice strawberries from North and South Carolina cost forty cents a box, and lower grades sell for twenty to twenty-five cents.

No lawn is quite as beautiful as one of fine grasses, but we agree with the *Rural New-Yorker* that a lawn of White Clover, pure and simple, is by no means unsightly, as any one can see by examining some of the little plots about the hotels in the upper part of this city. This Clover will stand drought better than most kinds of Grass, especially than the Rhode Island Bent Grass or Blue Grass, and it can be readily and easily cut by the lawn-mower, but the point made by the *Rural New-Yorker* is that White Clover, being a leguminous plant, will take up the free nitrogen of the air and transfer it to the soil, and thus enrich it constantly in one of the elements of plant-food. It would be an interesting experiment to see how long a White Clover lawn would last if a little phosphoric acid and potash were applied to it every year.

A circular published by the Entomological Division of the Department of Agriculture, and just issued, describes the natural history and habits of the Strawberry weevil, which is very injurious to the staminate varieties of the Strawberry. The pistillate varieties, except such as furnish a considerable quantity of pollen, are not subject to attacks, because it is the pollen of the flower which furnishes the chief food-supply, both of the larvæ and the adults. This explains the preference of the insect for such varieties as Charles Downing, Sharpless, Wilson and the like. Crude carbolic acid, used in the proportion of one part to a hundred parts of water, if sprayed over the plants, is a good repellent. It does not kill the insect, but it makes the plant distasteful so that they will not feed on it. In the same way the Bordeaux mixture has proved somewhat useful by rendering the foliage disagreeable to the insects. It has also the advantage of being a fungicide and will therefore fulfill a double purpose in plants which are in danger of infection by the blight.

In a bulletin on apple-growing in New Jersey, prepared by Director Voorhees, of the Experiment Station of that state, the average value of the crop per acre throughout the state is set down as something like $50.00, which shows that under ordinary conditions this crop is fairly remunerative. When orchards are managed with care and skill the returns are more satisfactory, and as an illustration of this Professor Voorhees cites the history of an orchard of thirty acres in Chester township, Burlington County. The soil, a sandy loam with a clayey subsoil sloping to the south-west, was carefully prepared before the stocky two-year-old trees were set in the autumn at a distance of thirty-three feet apart each way. The practice has been to seed the ground with Crimson Clover in July or August, to plow this under the next May, and then to cultivate the surface of the ground four or five times before seeding it again. A thousand pounds of an even mixture of ground bone and muriate of potash is applied broadcast every year before the clover seed is sown. The trees are pruned with tops well open to sun and air, and they are sprayed against insects and fungi. Under this treatment they bear annually fine crops of large perfect fruit, which is handled in the best manner, and the average of marketable apples for some years has been 130 barrels to the acre. The total annual expenses for each acre are $45.00, the gross returns $142.50, leaving a net return of $97.50 an acre. The varieties grown are Williams' Early Red, Hagloe, Orange Pippin and Ben Davis.

Last month Sir John Gorst spoke at Girton on the question of education in rural England, and told his hearers that they could not successfully compete in agricultural products with Continental nations, who sent many things to England which ought to be grown at home. Denmark at the beginning of this century was one of the poorest countries in Europe, and to-day it is one of the richest, because Denmark supplies the English people in manufacturing towns, and even in country districts, with butter, eggs and bacon which Englishmen ought to produce themselves. The people of Denmark attribute their prosperity to the education received in the high schools, where every boy and girl is kept until fourteen years of age; besides this, there are winter and evening schools in that country where any one can study until he is thirty. Sir John also pointed out that the children in rural France were kept at school in the same way, and that, in addition to the money expended for general education, France devoted a million dollars a year to special teaching in agriculture and horticulture. Instruction in these arts, he said, was obligatory even in primary schools in the country, and all over France they had higher schools, schools of practice, and itinerant teachers and experimental plots at convenient distances, where demonstrations were given. There are more than 3,300 of these experimental gardens in France. Sir John thought it was a mistake to endeavor to fit country lads for third-class clerkships in the cities instead of fitting them for country pursuits, since the restoration of prosperity in the rural districts depends upon the intelligence of the country population which furnished the workers.